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MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052-6399

EXAMINER	
ARCOS, CAROLINE H	
ART UNIT	**PAPER NUMBER**
2195	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

roks@microsoft.com
ntovar@microsoft.com
a-rydore@microsoft.com

Office Action Summary	Application No.	Applicant(s)	
	10/656,355	MATHESON ET AL.	
	Examiner	Art Unit	
	CAROLINE ARCOS	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-18 and 20-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-18 and 20-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09/05/2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, 3-18 and 20-31 are pending for examination.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "104" has been used to designate different tasks in the task log, reference character "124" has been used to designate different tasks in the schedule state, reference character "106" has been used to designate task container 106 and task container 104, reference character "108" has been used to designate different resource container in the task container and reference character "112" has been used to designate different constraint in the task container. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 3-18 and 20-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The following terms lacks antecedent basis:

i. the probability- claim 1.

b. The claim language in the following claims is not clearly understood:

i. As per claim 1, lines 9-11, it is not clearly understood how does the task will influence another based on schedule or selection criteria? (i.e. are they sharing the same resource and they require that resource at the same time?). line 11, it is unclear whether "current schedule state" and "selection criteria" are they located in each resource container of each task container or where do they reside?

ii. As per claim 7, line 2, it is unclear whether "a probability" is the same referred in claim 1 or a different probability? (i.e. if it is the same probability, it should be referred to as said probability).

iii. As per claim 8, it has the same deficiency as claim 7.

iv. As per claim 9, it has the same deficiency as claim 7.

v. As per claim 15, line 10, it is unclear what is meant by "pair-wise cost"? (i.e. is it the least cost?).

vi. As per claim 18, lines 11, it is not clearly understood how does the task will influence another based on schedule or selection criteria? (i.e. are

they sharing the same resource and they require that resource at the same time?). Line 12, it is unclear whether "current schedule state" and "selection criteria" are they located in each resource container of each task container or where do they reside?

vii. As per claim 26, line 5, it is not clearly understood whether the other task required the same one or more resources required by another task or different resource? Line 8, it is unclear what is meant by "reversing side-effects"?

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 4-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being anticipated by Druschel et al. ("The icecube approach to the reconciliation of divergent replicas", 2001, ACM, pages 210-218), in view of Walker et al. (US 5,963,911).

7. Walker et al. (US 5,963,911) was presented in previous office action.

8. As per claim 1, Druschel teaches the invention substantially as claimed including a method comprising:

receiving a plurality of task containers each said task container (action) representing a task to be scheduled (pg. 211, right col. , lines 30-32), where each said task container is includes a grouping of a plurality of resource containers, wherein each said resource container includes resource information that specifies one or more resources required for the represented task (Pg. 212, left col., lines 6-10) and selection criteria to select from the one or more resources (pg. 212, right col., lines 1-10 ; Fig.2);

an interface function that when called determines the probability that the task represented by another task container will influence the task represented by the called task container based on a current schedule state and selection criteria specified in resource containers of the another task container and the called task container (pg. 212, right col. Lines 11-25; pg. 214, right col., lines 34-51);

9. Druschel doesn't explicitly teach that each said task container further includes an interface function; generating a cost for each task (pg. 214, right col., lines 39-51) based on probabilities that the task will influence each other task in the plurality of tasks using the containers and scheduling the task with the least cost.

10. However, Walker teaches generating a cost for each task based on probabilities that the task will influence each other task in the plurality of tasks using the containers (col.2, lines 38-41; col. 2, lines 55-59)and scheduling the task with the least cost (col.2,

lines 60-61).

11. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Druschel and Walker because Walker's teaching of generating cost for each task would improve Druschel system efficiency and scheduling performance by scheduling the task with the least cost which enhance CPU usage.

12. The combined teaching of Druschel and Walker doesn't explicitly teach that each said task object further includes an interface function. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the interface function in the task object or outside the task object because it is a design/implementation choice.

13. As per claim 4, Walker teaches receiving a timeslot definition associated with each of the plurality of tasks or resources, the timeslot definition defining a required timeslot for the associated task or resource (col.1, lines 65-67).

14. As per claim 5, Walker teaches that the timeslot definition comprises an early start indicator (col.1, lines 63-64), a late finish indicator(col.18, lines 45-46), and a duration indicator (col.2, lines 50-51).

15. As per claim 6, Walker teaches receiving a constraint describing a time constraint between two tasks in the plurality of tasks; and scheduling the two tasks based on the

constraint (abs., lines 2-4; col. 2, lines 1-5; col. 17, lines 52-55).

16. As per claim 7, Walker teaches the generating comprises:

determining a probability that a first task in the plurality of tasks influences a second task in the plurality of tasks based on the resource information (col.2, lines 35-41) and adjusting the cost of the first tasks based on a function of the probability that the first task in the plurality of tasks influences the second task in the plurality of tasks (col.,14, lines 37-38; col. 21, lines 59-64).

17. As per claim 8, Walker teaches that the generating comprises:

determining a probability that a first task in the plurality of tasks supports a second task in the plurality of tasks based on the resource information; and

if the first task supports the second task, reducing the cost of the first task based on a function of the probability that the first task supports the second task (col.2, lines 38-41; col. 21, lines 49-52).

18. As per claim 9, Walker teaches that the generating comprises:

determining a probability that a first task in the plurality of tasks competes with a second task in the plurality of tasks based on the resource information; and

if the first task competes with the second task, increasing the cost of the first task based on a function of the probability that the first task competes with the second task (col.2, lines 20-23; col.18, lines 14-19; col. 21, lines 59-64).

19. As per claim 10, Walker teaches the generating comprises: selecting a first task from among the plurality of task (col.3, lines 29-31); for each of the other tasks in the plurality of tasks, determining a pair-wise probability, the pair-wise probability representing a probability that the first task will compete with the other task (col.2, lines 20-26); and

summing the pair-wise probabilities to form a total cost associated with the first task (abs. lines 6-7; col.2, lines 2-5).

20. As per claim 12, Druschel teaches the generating comprises applying preference values to the tasks (pg. 210, right col., lines 20-22; pg. 212, right col., lines 26-40).

21. As per claim 13, Walker teaches the generating comprises tabulating a cost associated with each pair of tasks (col.5, lines 40-41; col.7, lines 37-38)..

22. As per claim 14, Walker teaches removing the scheduled task from a main task log (col.16, lines 24-27);

adjusting probabilities associated with resources remaining in the main task log based on the scheduled task (col.4, lines 4-7); and

re-generating a cost for each task based on probabilities that the task will influence each other task in the plurality of tasks using the resource containers (col.18, lines 14-19).

23. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being anticipated by Druschel et al. ("The icecube approach to the reconciliation of divergent replicas", 2001, ACM, pages 210-218), in view of Walker et al. (US 5,963,911) and further in view of Sankaranarayan (WO 01/84301 A2).

24. Sankaranarayan (WO 01/84301 A2) was presented in previous office action.

25. As per claim 3, the combine of Druschel and Walker doesn't explicitly teach the each selection criteria specifies a relationship selected from a group consisting of:

an "AND" relationship indicating that all of a plurality of the resources are required to complete the represented task ;

an "XOR" relationship indicating that only one of the one or more resources is required to complete the represented task; and

an "OR" relationship indicating that one or more of the one or more resources are required to complete the represented task.

26. However, Sankaranarayan teaches the each selection criteria specifies a relationship selected from a group consisting of:

an "AND" relationship indicating that all of a plurality of the resources are required to complete the represented task (pg. 34, lines 10-11);

an "XOR" relationship indicating that only one of the one or more resources is required to complete the represented task (pg. 25, line 9); and

an "OR" relationship indicating that one or more of the one or more resources are

required to complete the represented task (pg. 62, lines 21-24).

27. It would have been obvious to one of ordinary skill in the art at the time the invention was made at the time the invention was made to combine Druschel, Walker and Sankaranarayan because Sankaranarayan teaching of different selection criteria would improve system scheduling performance by indicating which through the selection criteria which resource is critical and which resource is optional.

28. As per claim 11, the combined teaching doesn't teach the resource information comprises preference information describing preferences of the one or more resources. However, Sankaranarayan teaches the resource information comprises preference information describing preferences of the one or more resources (pg. 62, line 24).

29. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Druschel, Walker and Sankaranarayan because Sankaranarayan teaching of having different preferences of different resources would improve the system scheduling performance since it make it easier to choose from different preference and not only one preset preference which one step to prevent deadlock.

30. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being anticipated by Sankaranarayan (WO 01/84301 A2), in view of Walker et al. (US 5,963,911).

31. As per claim 15, Sankaranarayan teaches a computer-readable medium storing processor-executable instructions for performing a method comprising:

receiving a plurality of first resource identifier identifying first resources associated with a first candidate task (400(1), fig. 4; 502(1), fig. 5) and selection criteria defining how the first resources are to be selected from the plurality of first resources (pg. 16, lines 13-14; pg. 16, lines 22-25), receiving a second resource identifier identifying a second resource associated with a second candidate task (pg. 40, lines 1-2);

32. Sankaranarayan doesn't explicitly teach queuing a task container to determine a pair-wise cost of scheduling the first candidate task based on the first resources, the second resource and the selection criteria; and scheduling one or more of the first candidate task and the second candidate task based on the determined pair-wise cost.

33. However, Walker teaches queuing a task container to determine a pair-wise cost of scheduling the first candidate task based on the first resources, the second resource and the selection criteria; and scheduling one or more of the first candidate task and the second candidate task based on the determined pair-wise cost (col. 2, lines 8-12; col. 2 lines 20-26; col. 18, lines 14-19; col. 21, lines 61-67).

34. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Sankaranarayan and Walker because Walker teaching of pair wise would improve Sankaranarayan system performance and scheduling technique by scheduling the tasks with the least cost and that don't conflict to scheduled at the same

time which improve CPU and resource usage.

35. As per claim 16, Sankaranarayan teaches the scheduling comprises: identifying one or more of the first resources that are not the same as the second resource and that satisfy the selection criteria (pg. 39, lines 20-25; pg. 40, lines 1-2).

36. As per claim 17, Sankaranarayan teaches receiving a current schedule state having currently scheduled tasks and currently scheduled resources (col.16, lines 24-27);

determining whether the first candidate task and the second candidate task are viable based on the current schedule state (col.3, lines 37-41; col.14, lines 37-38); and

eliminating one or more of the first or second candidate task from consideration if the one or more of the first or second candidate task is not viable (col.12, lines 44-51).

37. Claims 18 and 20-25 are rejected under 35 U.S.C. 103(a) as being anticipated by Druschel et al. ("The icecube approach to the reconciliation of divergent replicas", 2001, ACM, pages 210-218), in view of Sankaranarayan (WO 01/84301 A2) and further in view of Walker et al. (US 5,963,911).

38. As per claim 18, Druschel teaches a system for scheduling a plurality of tasks, the system comprising:

a task log including a plurality of task objects, each said task object representing a task to be scheduled (pg. 211, right col., lines 30-32), each said task object having one or more resource objects (pg.212, left col., lines 6-10), an interface function that, when

called determines the probability that another task represented by another task object will influence the task represented by said called task object (pg. 212, right col., lines 11-25), said determination based on a current schedule state and resource selection logic associated with said another task object and said called task object (pg. 212, right, col., lines 13-15).

39. Druschel doesn't explicitly teach that each said resource object representing a resource that is selectable for the associated task according to resource selection logic, and wherein each said task object further includes an interface function, a cost generator operable to generate a cost for each of the tasks based on probabilities that each said task will influence each other said task; and a scheduling engine operable to schedule the task with the least cost.

40. However, Sankaranarayan teaches that each said resource object representing a resource that is selectable for the associated task according to resource selection logic (102, fig. 12; pg. 26, lines 6-12).

41. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Druschel and Sankaranarayan because Sankaranarayan teaching of resource that is selectable based on resource selection logic would improve Druschel system scheduling performance and efficiency by selecting resource based on some logic/ policy to regulate resource usage.

42. The combined teaching of Druschel and Sankaranarayan doesn't explicitly teach each said task object further includes an interface function; a cost generator operable to generate a cost for each of the tasks based on probabilities that each said task will influence each other said task; and a scheduling engine operable to schedule the task with the least cost.

43. However, Walker teaches a cost generator operable to generate a cost for each of the tasks based on probabilities that each said task will influence each other said task (col.2, lines 38-41; col.2, lines 55-59); and

a scheduling engine operable to schedule the task with the least cost (col.2, lines 60-61).

44. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Druschel, Sankaranarayan and Walker because Walker's teaching of cost generation and scheduling task based on the least cost would improve the system efficiency and scheduling performance by scheduling the task with the least cost which enhance CPU usage.

45. The combined teaching doesn't explicitly teach that each said task object further includes an interface function. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the interface function in the task object or outside the task object because it is a design/implementation choice.

46. As per claim 20, Sankaranarayan teaches the resource selection logic is selected from a group consisting of:

an "AND" function indicating that all of the plurality of resources are required (pg. 34, lines 10-11);

an "XOR" function indicating that one and only one of the plurality of resources is required (pg. 25, line 9); and

an "OR" function indicating that at least one of the plurality of resources is required (pg. 62, lines 21-24).

47. As per claim 21, Walker teaches the cost generator is further operable to calculate pair-wise costs representing a cost of scheduling a first task relative to a second task (col. 2, lines 20-26).

48. As per claim 22, Walker teaches the cost generator is further operable to tabulate pair-wise costs representing a cost of scheduling a first task relative to a second task and generate a total cost associated with each of the tasks (col. 2, lines 20-26; col.2, lines 52-54).

49. As per claim 23, Walker teaches the task object further comprises time constraint information indicating at least one time constraint between two of the tasks (abs., lines 2-4; col.2, lines 1-5; col.17, lines 52-55).

50. As per claim 24, Druschel teaches the task log further comprises a hierarchical arrangement of the task objects and the resource objects (pg. 211, right col., lines 30-32; pg 212, left col., lines 6-10).

51. As per claim 25, Druschel teaches that each task object is operable to return a probability that the task object competes with another task object (pg. 212, right col., lines 11-25; pg. 214, right col., lines 48-51).

52. Claims 26-31 are rejected under 35 U.S.C. 103(a) as being anticipated by Walker et al. (US 5,963,911), in view of Druschel et al. ("The icecube approach to the reconciliation of divergent replicas", 2001, ACM, pages 210-218).

53. As per claim 26, Walker teaches a method comprising:

generating a cost associated with each of a plurality of tasks to be scheduled (col. 2, lines 52-54), wherein each task requires one or more resources, and wherein at least one of the tasks requires a plurality of resources (col.2, lines 15-20), and wherein generating the cost of the at least one task is based on a probability that other tasks require one or more of the plurality of resources(col. 2, lines 6-7);executing a minimum cost task (col.2, lines 8-12).

54. Walker doesn't explicitly teach scheduling the minimum cost task if the minimum cost task successfully execute and reversing side-effects from the executing if the minimum cost task fails to execute. However, Druschel teaches scheduling the minimum

cost task if the minimum cost task successfully execute and reversing side-effects from the executing if the minimum cost task fails to execute (pg. 212, left col., lines 49-59; pg. 214, right col., lines 39-51).

55. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Walker and Druschel because Druschel teaching of scheduling the minimum cost task if the minimum cost task successfully execute and reversing side-effects from the executing if the minimum cost task fails to execute would improve Walker system performance and scheduling techniques efficiency by predicting the result of the minimum cost and act upon which prepare the system ahead with the right task schedule without wasting system resources.

56. As per claim 27, Walker teaches the generating comprises determining a pair-wise probability representing a probability that a first task in the plurality of tasks conflicts with a second task in the plurality of tasks (col.2, lines 20-26; col.18, lines 14-19).

57. As per claim 28, Walker teaches adjusting the pair-wise probability in response to scheduling the minimum cost task (col.2, lines 8-12; col. 21, lines 61-67).

58. As per claim 29, Druschel teaches the generating comprises determining the costs based upon preference weights assigned to the plurality of tasks (pg. 210, right col., lines 20- 21; pg. 212, right col., lines 26-40).

59. As per claim 30, Walker teaches determining viability of each task in the plurality of tasks (col.14, lines 37-38).

60. As per claim 31, Druschel teaches reversing side-effects comprises de- allocating any resources allocated during the executing and de-scheduling any tasks that were scheduled during the executing ((pg. 212, left col., lines 49-59; pg. 214, right col., lines 39-51).

Conclusion

61. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Barber et al. ("Conflict detection during plan integration for multi-agent systems", IEEE, 2001, pages 616-628).

(US 6,430,591 B1) teaches rendering electronic images using method interface to check shared resource.

62. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAROLINE ARCOS whose telephone number is (571)270-3151. The examiner can normally be reached on Monday-Thursday 7:00 AM to 5:30 PM.

63. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

64. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195

Patent Examiner
Caroline Arcos